COMSPHERE 3600 SERIES DATA SERVICE UNITS MODELS 3610 AND 3611

DOCUMENTATION REPLACEMENT

Document No. 3610-A2-GB43-50
Feature No. 3600-G3-002

December 1996

PARADYNE™

COMSPHERE
3600 Series Data Service Units
Models 3610 and 3611

Documentation Replacement
3610-A2-GB43-50
Feature No. 3600-G3-002

6th Edition (December 1996)

Changes and enhancements to the product and to the information herein will be documented and issued as a new release.

United States
FCC Registration number: AW292J-61661-DD-N
PSTN Ringer Equivalence number (REN):
— V.32 DBM option 0.7B
— V.34 DBM option 0.2B

Canada
V.32 Dial Backup Module
Certification number: 230 3684 A
DOC Load number: 7
V.34 Dial Backup Module
Certification number: 230 6811 A
DOC Load number: 3
2-Wire Switched 56 DBM
Certification number: 230 5870 A
DOC Load number: 0
ISDN Dial Backup Module
Certification number: 230 6943 A
DOC Load number: 0

Warranty, Sales, and Service Information

Contact your sales or service representative directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, or training, use one of the following methods:

- **Via the Internet:** Visit the Paradyne World Wide Web site at http://www.paradyne.com
- **Via Telephone:** Call our automated call system to receive current information via fax or to speak with a company representative.
  — Within the U.S.A., call 1-800-870-2221
  — International, call 727-530-2340

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Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. This product is intended to be used with a three-wire grounding type plug – a plug which has a grounding pin. This is a safety feature. Equipment grounding is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adapter.

   Prior to installation, use an outlet tester or a voltmeter to check the ac receptacle for the presence of earth ground. If the receptacle is not properly grounded, the installation must not continue until a qualified electrician has corrected the problem.

   If a three-wire grounding type power source is not available, consult a qualified electrician to determine another method of grounding the equipment.
3. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
4. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
5. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
6. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
7. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
8. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.

In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

Notices

WARNING

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

THE AUTHORITY TO OPERATE THIS EQUIPMENT IS CONDITIONED BY THE REQUIREMENTS THAT NO MODIFICATIONS WILL BE MADE TO THE EQUIPMENT UNLESS THE CHANGES OR MODIFICATIONS ARE EXPRESSLY APPROVED BY PARADYNE.

WARNING

TO USERS OF DIGITAL APPARATUS IN CANADA:

THIS CLASS A DIGITAL APPARATUS MEETS ALL REQUIREMENTS OF THE CANADIAN INTERFERENCE–CAUSING EQUIPMENT REGULATIONS.

CET APPAREIL NUMÉRIQUE DE LA CLASSE A RESPECTE TOUTES LES EXIGENCES DU RÈGLEMENT SUR LE MATÉRIEL BROUILLEUR DU CANADA.

Government Requirements

Certain governments require that instructions pertaining to connection to the telephone network be included in the installation and operation manual. Specific instructions are listed in the following sections.

United States

Notice to Users of the Telephone Network

This equipment complies with Part 68 of the FCC rules. On the bottom of the equipment is a label or silk-screened text that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. If requested, please provide this information to your telephone company.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most areas, the sum of the RENs of all devices should not exceed 5. Call your local telephone company to ascertain the maximum REN for your calling area.

If your Model 3610 or 3611 DSU with DBM causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If so, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

The DBM cannot be used on public coin-operated telephone service provided by the telephone company. Connection to party-line service is subject to state tariffs. Contact the state public utility commission, public service commission, or corporation commission for information.

No repairs may be performed by the user. Should you experience difficulty with this equipment, refer to *Equipment Warranty and Support*.

For Digital Data Service (DDS) installations, inform the local telephone company of the appropriate facility interface code for the service you desire.

DDS Facility	
Interface Code	**Data Rate (bps)**
04DU5-24	2400
04DU5-48	4800
04DU5-96	9600
04DU5-19	19,200
04DU5-38	38,400
04DU5-56	56,000
04DU5-64	64,000

The DDS Service Order Number is 6.0Y. The jack configurations required are RJ48S for the Model 3610 DSU and RJ48T for the Model 3611. With the Model 3611 RJ48T configuration, you must specify the number of data lines you require. Refer to Chapter 1, *Technical Specifications*.

For DBM installations, the proper service and jack must be ordered from the telephone company. Refer to the following table for this information.

DBM Jack Installation Requirements				
DBM Type	**USOC Jack (Standalone)**	**USOC Jack (Carrier-Mounted)**	**Canadian Jack (Standalone)**	**Canadian Jack (Carrier-Mounted)**
12.0 or 14.4 kbps V.32bis DBM	RJ11C Permissive RJ45C Programmable	RJ21X Permissive RJ27X Programmable	CA11A Permissive CA27A Programmable	CA21A Permissive CA27A Programmable
V.34 DBM	RJ11C Permissive	RJ21X Permissive	CA11A Permissive	CA21A Permissive
2-Wire Switched 56 DBM	SJA48	SJA48 (uses an adapter cable)	CA11 (metallic channel)	CA21A (metallic channel)
4-Wire Switched 56 DBM	SJA56	SJA57	Not available in Canada	Not available in Canada
ISDN BRI DBM	SJA11	SJA11 (uses an adapter cable)	CA-A11	CA-A11 (uses an adapter cable)

After the telephone company has installed the requested service and jack, you can connect the DSU with the cable provided. An FCC-compliant telephone cord and modular plug are provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant.

Canada

Notice to Users of the Canadian Telephone Network

The Canadian Department of Communications has certified that this equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee that the equipment will operate to the user's satisfaction.

Before installation, verify connectivity of this equipment to the local telecommunications company's facilities. The equipment must be connected by an acceptable method. In some cases, the telecommunications company's inside wiring associated with single-line individual service may be extended with a certified connector assembly (telephone connection cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

If you experience difficulty with this equipment and require service, refer to the *Equipment Warranty and Support* section.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may cause the telecommunications company to ask you to disconnect the equipment.

Users should ensure that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together for protection. This precaution may be particularly important in rural areas.

CAUTION

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or an electrician, as appropriate.

The load number (LN) is labeled on the equipment. The LN denotes the percentage of the total load to be connected to a telephone loop used by this equipment. To prevent an overload, the total of the LNs of all devices attached to the loop may not exceed 100. The LN also specifies the appropriate ringing type (A or B), if applicable. For example, LN = 20A designates a load number of 20 and an A type ringer.

Equipment Warranty and Support

If you experience trouble with this equipment, please contact your sales or service representative (as appropriate) for repair or warranty information. If the product needs to be returned to the company service center for repair, contact them directly for return instructions using one of the following methods:

- **Via the Internet:** Visit the Paradyne World Wide Web site at http://www.paradyne.com
- **Via Telephone:** Call our automated call system to receive current information via fax or to speak with a company representative.
  - — Within the U.S.A., call 1-800-870-2221
  - — International, call 727-530-2340

If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved.

Preface

Objective

To better serve volume Model 3610 DSU customers, this replacement documentation has been provided so that customers can order only the number of User's Guides or Supplements wanted while permitting us to fulfill our legal and regulatory requirements.

- Document No. 3610-A2-GB46 ships with every Model 3610 DSU.
- Document No. 3610-A2-GB48 ships with every TDM or MCMP.
- Document No. 3610-A2-GB49 ships with every DBM.

Please refer to the *COMSPHERE 3600 Series Data Service Units (DSUs), Models 3610 and 3611, User's Guide*, Document No. 3610-A2-GB46, when operating the DSU.

Contents

Chapter 1 lists the technical specifications for the DSU, Dial Backup Modules (DBMs), Time Division Multiplexer (TDM), Multichannel Multipoint (MCMP) and the digital bridge options.

Chapter 2 describes electrical connection of the Model 3610 DSU, as well as Digital Data Service (DDS), Switched 56 kbps, dial, and ISDN networks.

Reference Documents

- ANSI X3.64 – 1979 (Reaffirmed 1990)
- ANSI T.410
- AT&T Technical Reference 41458
- AT&T Technical Reference 61330
- AT&T Technical Reference 62310 – 1987
- Bell Canada DCTE Specifications
- Bell Communications Research Technical Reference Publication 41028
- Bellcore Special Report SR-NWT-001953
- DATAPHONE II 2600 Series Data Service Units User's Manual
- EIA-232-D/V.24 (ISO 2110)
- Integrated Network Corporation Compatibility Bulletin CB-INC-101
- ITU-TSS (CCITT) V.35 (ISO 2593)
- Northern Telecom NIS S204-2© 1986
- Pacific Bell PUB L-780035-PB/NB
- Pacific Bell PUB L-780036-PB/NB

Call your sales representative for additional product documentation.

Product-Related Documents

The following table lists 3600-related documentation.

COMSPHERE 3600 Series Product-Related Documentation

Document Name	Document Number	Description
COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, User's Guide	3610-A2-GB46	User's Guide. Ships with all standalone 3610 DSUs. Provides descriptions of features, installation instructions, front panel operation, configuration options and worksheets, troubleshooting, messages, and specifications.
COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options Supplement	3610-A2-GB48	Supplement to the User's Guide. Ships with all standalone 3610 DSUs with TDM, MCMP, or Digital Bridge options or upgrades. Provides descriptions of TDM, MCMP, and Digital Bridge features, installation instructions, front panel operation, configuration options and worksheets, troubleshooting, messages, and specifications.
COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module Options Supplement	3610-A2-GB49	Supplement to the User's Guide. Ships with all standalone 3610 DSUs with Dial Backup Modules or upgrades. Provides descriptions of DBMs, features, installation instructions, front panel operation, configuration options and worksheets, troubleshooting, messages, and specifications.
COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Technical Reference Manual	3610-A2-GH30	Orderable. Provides detailed information on the DSU, DBM, SNA Diagnostic Interface, TDM, MCMP, and Digital Bridge features, specifications, configuration scenarios, async terminal operation, pin assignments, NMS operations, messages, and an equipment list.
COMSPHERE 3600 DBM Option Installation Instructions	3610-A2-GZ52	Ships with field-installable dial backup upgrades. Contains installation procedures for all Model 3610 and 3611 DBM types.
COMSPHERE 3000 Series Carrier, Installation Manual	3000-A2-GA31	Ships with every carrier. Contains installation procedures for the carrier and its components, options, and operation.
COMSPHERE –48 Vdc Central Office Power Unit, Installation Guide	3000-A2-GB41	Ships with every –48 Vdc power unit. Includes descriptions of features, installation instructions, troubleshooting, specifications, and an equipment list.
COMSPHERE 3600 Series Data Services Units, Models 3610 and 3611, Secondary Channel Applications Supplement	3610-A2-GB42	Orderable. Provides details on DSUs equipped with the Secondary Channel option. Provides descriptions of features, DSU operation, configuration examples, worksheets, and an equipment list.
COMSPHERE 6800 Series Network Management System, Communications Products Support, Command Reference Manual	6800-A2-GB31	Ships with software. Provides descriptions of device commands for interaction between 6800 Series NMS and other product lines.
COMSPHERE 6700 Series Network Management System, User's Guide	6700-A2-GY31	Ships with software and is orderable. Provides descriptions of NMS features, installation instructions, configuration setup, display and statistics options, reports generation, online help conventions, and input forms.

Technical Specifications 1

Technical Specifications 1-1

Technical Specifications

Tables 1-1 through 1-11 list the technical specifications for the following:

- General COMSPHERE® 3600 Series (Table 1-1)
- DSU (Table 1-2)
- 3600 Hubbing Device (Table 1-3)
- V.32 DBM and DBM-V (Table 1-4)
- V.34 DBM and DBM-F (Table 1-5)
- 2-Wire Switched 56 DBM and DBM-D (Table 1-6)
- 4-Wire Switched 56 DBM and DBM-S (Table 1-7)
- ISDN DBM and DBM-I (Table 1-8)
- TDM (Table 1-9)
- MCMP (Table 1-10)
- Digital Bridge (Table 1-11)

Table 1-1
(1 of 3)
General COMSPHERE 3600 Series Technical Specifications

Specifications	Criteria
AC POWER FUSE	
Model 3610/3611 DSU	No accessible fuse
3000 Series Carrier	4-amp fuse, Paradyne part number 190-0037-0431 (two spares supplied with carrier)
AC POWER REQUIREMENTS	
3610 DSU 3610 DSU with DBM	24 Vac (CT), 60 Hz ±3 (0.093 amp, 5.8 watts at 115 Vac) 24 Vac (CT), 60 Hz ±3 (0.114 amp, 9.5 watts at 115 Vac)
3611 DSU 3611 DSU with DBM	24 Vac (CT), 60 Hz ±3 (0.029 amp, 4.5 watts at 115 Vac) 24 Vac (CT), 60 Hz ±3 (0.080 amp, 8.0 watts at 115 Vac)
DBM (V.32 or Switched 56)	24 Vac (CT), 60 Hz ±3 (0.024 amp, 2.0 watts at 115 Vac)
3000 Series Carrier (16 DSUs with DBMs plus SDU and fan module)	90—132 Vac, 60 Hz ±3 (1.650 amp, 165 watts at 115 Vac)

Table 1-1
(2 of 3)
General COMSPHERE 3600 Series Technical Specifications

Specifications	Criteria
APPROVALS	
FCC Part 15	Class A digital device
FCC Part 68	AW292J-61661-DD-N
UL	
3610 DSU	Listed UL 1950
3611 DSU, 3000 Series Carrier	Recognized Component UL 1950
CSA	
Safety	
3610 DSU	Certified CSA 22.2, No. 220-M1986
3611 DSU, 3000 Series Carrier	Certified Component CSA 22.2, No. 950-M89
Emissions	Class A digital apparatus
Bell Canada	"DCTE Specifications," July 1989, Issue 1
DTE INTERFACE	
3610 and Non-modular 3611 DSUs	
25-pin D-subminiature connector	EIA-232-D / ITU (CCITT) V.24 (ISO 2110)
34-pin connector	ITU (CCITT) V.35 (ISO 2593)
Modular 3611 DSU	EIA-232-D / ITU (CCITT) V.24 (ISO 2110)
25-Pin V.35 Interface	ITU (CCITT) V.35 (ISO 2593)
Uses a Rear Connector Plate with two 25-pin D-subminiature connectors	A modular DSU V.35 interconnect cable is required to use the V.35 connector. The cable provides an interface between the DSU's 25-pin D-type connector and the DTE cable's V.35 connector.
ENVIRONMENT	
Operating Temperature	32° to 122° F (0° to 50° C)
Storage Temperature	–4° to 158° F (–20° to 70° C)
Relative Humidity	5%—95% (noncondensing)
Shock and Vibration	Withstands normal shipping and handling
HEAT DISSIPATION (MAX.) AT 115 VAC	
3610 DSU	22.16 Btu/hr.
3610 DSU with DBM	29.00 Btu/hr.
3611 DSU	22.16 Btu/hr.
3611 DSU with DBM	27.30 Btu/hr.
3000 Series Carrier (16 DSUs with DBMs plus SDU and fan module)	563.00 Btu/hr.
NMS COMPATIBILITY	DATAPHONE II System Controller, Diagnostic Console, or Network Controller COMSPHERE 6700 Series NMS, Release 4.0 or greater for full support COMSPHERE 6800 Series NMS, Release 4.1.5 or greater for full support NetView™, Version 1, Release 3 or greater
ASYNC TERMINAL	ANSI X3.64/VT-100 compatibility Rate: 9.6 kbps 8 bits per character, 1 stop bit, no parity

Table 1-1
(3 of 3)
General COMSPHERE 3600 Series Technical Specifications

Specifications	Criteria
DATA RATES	Primary channel rates: 64, 56, 38.4, 19.2, 9.6, 4.8, and 2.4 kbps Async/Sync rates: 64, 56, 48, 38.4, 32, 19.2, 18.8, 18.0, 16.8, 14.4, 12.0, 9.6, 9.2, 7.2, 4.8, 4.4, 2.4, 2.0, and 1.2 kbps Other asynchronous rates (e.g., 150, 300, 600, and 1800 bps) can be obtained through oversampling Asynchronous rates support ITU (CCITT) V.14 extended rate range at 8 to 12 bits per character, including the *start* and *stop* bit (+2.3, –2.5 percent overspeed/underspeed compensation at 10 bits per character)
PHYSICAL DIMENSIONS	
3610 DSU	
Height	2.13 inches (5.4 cm)
Width	7.63 inches (19.4 cm)
Depth	12.13 inches (30.8 cm)
3611 DSU (non-modular or modular)	
Height	7.13 inches (18.1 cm)
Width (thickness)	0.90 inch (2.3 cm)
Depth	13.40 inches (34.0 cm)
Rear Connector Plate (2-port)	
Height	5.24 inches (13.3 cm)
Width	0.88 inch (2.2 cm)
Depth (25-Pin V.35 Interface)	1.00 inch (2.5 cm)
3000 Series Carrier	
Height	10.50 inches (26.7 cm)
Width	19.00 inches (48.3 cm)
Depth	14.00 inches (35.6 cm)
WEIGHT	
3610 DSU	3.70 pounds (1.68 kg)
3610 DSU with DBM	4.10 pounds (1.86 kg)
3611 DSU (modular)	0.91 pound (0.41 kg)
3611 DSU (modular) with DBM	1.34 pounds (0.61 kg)
3611 DSU (non-modular)	1.05 pounds (0.48 kg)
3611 DSU (non-modular) with DBM	1.50 pounds (0.68 kg)
Rear Connector Plate (2-port) 25-Pin EIA-232/25-Pin V.35	0.13 pound (0.06 kg)
3000 Series Carrier (16 DSUs with DBMs plus SDU and fan module)	70.00 pounds (31.8 kg)

Table 1-2
DSU Technical Specifications

Specifications	Criteria
APPLICATION	Full- or half-duplex data transmission via point-to-point or multipoint DDS network, or local area data channel
COMMUNICATION LINE	Leased or private 4-wire DDS line
DATA RATES	
Digital Services (DDS, ASDS)	2.4, 4.8, 9.6, 19.2, 38.4, 56, and 64CC kbps
LADS	2.4, 4.8, 9.6, 19.2, 38.4, 56, and 64 kbps
Clear Channel[1]	64 kbps (on a 72 kbps circuit) with the *64KScrambling* configuration option enabled
When timing is external (provided by the DTE), the DTE's clock must be within these ranges.	64CC kbps ± 11 bps 56 kbps ± 9 bps 38.4 kbps ± 4 bps 19.2 kbps ± 5 bps 9.6 kbps ± 1 bps 4.8 kbps ± 0 bps 2.4 kbps ± 0 bps
DDS NETWORK INTERFACE	
3610 DSU	8-pin modular jack USOC RJ48S
3611 DSU	(One or two) 50-pin connector USOC RJ48T
DIAGNOSTIC INTERFACE	
3610 DSU	Requires 3600 Hubbing Device which provides two 8-pin modular jacks
3611 DSU	Via the SDU in the COMSPHERE 3000 Series Carrier or DC-OUT via NMS adapter cable (for a tributary in the carrier)
NETWORK COMPATIBILITY	
ANSI T1.410 –1992 and AT&T Technical Reference 62310 – 1987	2.4, 4.8, 9.6, 56, and 64 kbps
Integrated Network Corporation Compatibility Bulletin CB-INC-101, and Pacific Bell publications PUB L-780035-PB/NB and PUB L-780036-PB/NB	19.2 kbps loop at levels of +6, 0, or –10 dBm
DSU COMPATIBILITY	
Primary Channel	All Paradyne digital products and other products that are compliant with AT&T Technical Reference 62310 – 1987
Diagnostic Channel	
Point-to-Point or Multipoint:	3600 Series — enhanced 3600 diagnostics (nondisruptive or disruptive) 3500 Series — 2600 diagnostics 2600 Series — 2600 diagnostics
Point-to-Point Only:	2500 Series — 2500 loopbacks

[1] If a 3600 Series DSU is not used on both ends of the circuit or if the scrambler configuration option (64KScrambling) is not enabled, the customer's DTE must provide for the primary data's ones (1s) density.

Table 1-3
3600 Hubbing Device Technical Specifications

Specifications	Criteria
APPLICATION	Diagnostic interfaces for the Model 3610 DSU
NETWORK MANAGEMENT INTERFACES NMS	 Two 8-pin modular jacks *(Note that the 3600 Hubbing Device has a 6-inch attached cable that terminates in a 4-pin modular plug.)*
PHYSICAL DIMENSIONS Height Width (thickness) Depth	 1.9 inches (4.8 cm) 0.9 inches (2.3 cm) 3.4 inches (8.6 cm)
WEIGHT	0.13 pounds (0.06 kg)

Table 1-4
V.32 DBM and DBM-V Technical Specifications

Specifications	Criteria
RINGER EQUIVALENCE NUMBER (REN)	DBM option 0.7B
APPROVALS DOC Certification (PSTN) Load Number	 230 3684 A 7
APPLICATION	Full- or half-duplex data transmission via analog 2-wire Dial Network (PSTN), point-to-point
MODULATION AND FREQUENCY	At 12 and 14.4 kbps: CCITT V.32bis, 1800 Hz At 4.8 and 9.6 kbps: CCITT V.32, 1800 Hz At 2.4 kbps: CCITT V.22bis, 2400 Hz
CHANNEL EQUALIZATION Transmitter Receiver	 Compromise equalizer Automatic adaptive equalizer
COMMUNICATION LINE	2-wire analog (PSTN) line
DATA RATES	2.4, 4.8, 7.2, 9.6, 12, 14.4 kbps
DBM COMPATIBILITY	If Call Setup is set for Callback or Password security, then the device is compatible with a 3600 Series V.32 DBM only. If Call Setup is set for Alarm or None, then any V.32 or V.34 modem can be used. Also, V.22bis at 2.4 kbps can be used.[1]
RECEIVE VF INTERFACE Dynamic Range V.32 2-wire PSTN Impedance	 –43 to –10 dBm 600 Ω
SWITCHED NETWORK INTERFACE 3610 DSU 3611 DSU	 6-pin modular jack Permissive: USOC RJ11C 8-pin modular jack Programmable: USOC RJ45S (One or two) 50-pin connector Permissive: USOC RJ21X Programmable: USOC RJ27X
TRANSMIT VF INTERFACE Signal Level V.32 2-wire PSTN Impedance	 Permissive: –9 dBm Programmable: –12 to 0 dBm 600 Ω

[1] If a non-3600 Series DBM V.32 modem calls into the DBM with firmware version 2.8 or lower, a manual switch to the Dial command is required to complete the backup process.

Table 1-5
V.34 DBM and DBM-F Technical Specifications

Specifications	Criteria
RINGER EQUIVALENCE NUMBER (REN)	DBM option 0.2B
APPROVALS DOC Certification (PSTN) Load Number	 230 6811 A 3
APPLICATION	Full- or half-duplex data transmission via analog 2-wire Dial Network (PSTN), point-to-point
MODULATION AND FREQUENCY	At 28.8 kbps: ITU-T V.34 At 12 and 14.4 kbps: CCITT V.32bis, 1800 Hz At 4.8 and 9.6 kbps: CCITT V.32, 1800 Hz At 2.4 kbps: CCITT V.22bis, 2400 Hz
CHANNEL EQUALIZATION Transmitter Receiver	 Compromise equalizer Automatic adaptive equalizer
COMMUNICATION LINE	2-wire analog (PSTN) line
DATA RATES	2.4, 4.8, 7.2, 9.6, 12, 14.4, 16.8, 19.2, 21.6, 24, 26.4, and 28.8 kbps
DBM COMPATIBILITY	If Call Setup is set for Callback or Password security, then the device is compatible with a 3600 Series V.32 or V.34 DBM only. If Call Setup is set for Alarm or None, then any V.32 or V.34 modem can be used. Also, V.22bis at 2.4 kbps can be used.
RECEIVE VF INTERFACE Dynamic Range V.34 2-wire PSTN Impedance	 –43 to –10 dBm 600 Ω
SWITCHED NETWORK INTERFACE 3610 DSU 3611 DSU	 6-pin modular jack Permissive: USOC RJ11C (One or two) 50-pin connector Permissive: USOC RJ21X
TRANSMIT VF INTERFACE Signal Level V.34 2-wire PSTN Impedance	 Permissive: –9 dBm 600 Ω

Table 1-6
2-Wire Switched 56 DBM and DBM-D Technical Specifications

Specifications	Criteria
APPROVALS DOC Certification Number Load Number	 230 5870 A 0
APPLICATION	Full- or half-duplex data transmission via 56 kbps switched services compatible with AT&T, US SPRINT®, and MCI® using DataPath™ 2-wire switched access to a local exchange carrier (LEC) or an interexchange carrier (IEC)
COMMUNICATION LINE	A dedicated 2-wire access or a local exchange carrier 2-wire switched access
DATA RATES	56 kbps *(Note that 2-wire Switched 56 DBM or DBM-D use proprietary rate adaption to support data rates of less than 56 kbps.)*
DBM COMPATIBILITY	If Call Setup is set for Callback or Password security, then the device is compatible with a 3600 Series Switched 56 DBM only. If Call Setup is set for Alarm or None, then any Switched 56 kbps terminal interface unit (TIU) can be used.
SWITCHED 56 KBPS NETWORK INTERFACE 3610 DSU 3611 DSU	 6-pin modular jack USOC SJA48 (One or two) 50-pin connector
NETWORK COMPATIBILITY	Northern Telecom NIS S204-2© 1986

Table 1-7
4-Wire Switched 56 DBM and DBM-S Technical Specifications

Specifications	Criteria
APPLICATION	Full- or half-duplex data transmission via 56 kbps switched services compatible with AT&T, MCI, and US SPRINT using 4-wire switched access to a local exchange carrier (LEC) or an inter-exchange carrier (IEC)
COMMUNICATION LINE	A dedicated 4-wire access or a local exchange carrier 4-wire switched access
DATA RATES	56 kbps *(Note that 4-wire Switched 56 DBM or DBM-S use proprietary rate adaption to support data rates of less than 56 kbps.)*
DBM COMPATIBILITY	If Call Setup is set for Callback or Password security, then the device is compatible with a 3600 Series Switched 56 DBM only. If Call Setup is set for Alarm or None, then any switched 56 kbps terminal interface unit (TIU) can be used.
SWITCHED 56 KBPS NETWORK INTERFACE 3610 DSU 3611 DSU	 8-pin modular jack USOC SJA56 (One or two) 50-pin connector USOC SJA57
NETWORK COMPATIBILITY	AT&T Technical References 41458 and 61330

Table 1-8
ISDN DBM and DBM-I Technical Specifications

Specifications	Criteria
APPROVALS DOC Certification	 230 6943 A
APPLICATION	Full-duplex data transmission via ISDN BRI U-Interface for point-to-point or multipoint facilities
MODULATION AND FREQUENCY	2B1Q line coding with 4-level pulse amplitude modulation (PAM) at 80 K baud
CHANNEL EQUALIZATION Receiver	 Automatic adaptive equalizer with echo cancellation
COMMUNICATION LINE	2-wire BRI ISDN line
DATA RATES	56 and 64 kbps *(Note that ISDN DBM or DBM-I use proprietary rate adaption to support data rates of less than 64 kbps.)*
DBM COMPATIBILITY	Compatible with 3600 Series 2-wire and 4-wire Switched 56 DBMs
RECEIVE INTERFACE Dynamic Range Impedance	 Operates on 2-wire loops as defined in ANSI T1.601-1992 135 Ω
SWITCHED NETWORK INTERFACE 3610 DSU 3611 DSU	 8-pin non-keyed modular jack USOC SJA11 U-Interface Connector (One or two) 50-pin connector Permissive: USOC RJ21X
TRANSMIT INTERFACE Signal Level Impedance	 13.5 dBm nominal over frequency band from 0 Hz to 80 kHz 135 Ω

Table 1-9
TDM Technical Specifications

Specifications[1]	Criteria
APPLICATION	
Multiplexing	Provides time division multiplexing of up to two or six independent ports, depending upon the version, 2-port or 6-port.
Digital sharing	Allows two groups of consecutive ports to share the same TDM channel.
FEP port sharing	Provides up to three separate FEP port-sharing groups.
Digital bridge	Configured to perform a 5-port digital bridge capability.
PORT SYNCHRONOUS RATES	1.2, 2.0, 2.4, 4.0, 4.4, 4.8, 7.2, 8.4, 9.2, 9.6, 12.0, 14.4, 16.8, 18.0, 18.8, 19.2, 28.8, 32, 38.4, 48, 56, and 64 kbps
PORT ASYNCHRONOUS RATES	150, 300, 600, 1200, and 1800 bps plus all primary (DSU) rates. Asynchronous rates support +2.3, –2.5 percent overspeed/underspeed compensation.
PORT DTE INTERFACE	
3610 DSU (2-port TDM/Flex)	Provides an additional 25-pin D-subminiature connector, for a total of two EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3610 DSU (6-port TDM/Flex)	Provides five additional 25-pin D-subminiature connectors, for a total of six EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3611 DSU (modular)	Provides a 6-port connector module that provides a total of six 25-pin D-subminiature EIA-232 connections (including the DSU). In addition, a 26-pin high-density D-type connector provides a V.35 interface through an adapter cable.
3610 DSU (TDM/DSD)	Provides five additional 25-pin D-subminiature connectors that can be optioned for EIA-232 or V.35, for a total of six EIA-232 or six V.35 interfaces.
3611 DSU (non-modular)	Provides one 60-pin high-density D-type connector that provides five additional EIA-232 interfaces through an adapter cable.
NMS SUPPORT	TDM capability is fully supported by the COMSPHERE 6700 or 6800 Series NMS, Release 4.0 or greater for the 6700 Series NMS and Release 4.1.5 or greater for the 6800 Series NMS software in ADp and DATAPHONE® II modes.

[1] TDM and MCMP circuit cards can be configured to provide TDM capability.

Table 1-10
MCMP Technical Specifications

Specifications[1]	Criteria
APPLICATION	
Multichannel multipoint	Allows up to two or six independent application programs to share one standard multipoint digital facility, depending upon the version, 2-port or 6-port.
Digital sharing	Allows up to three digital-sharing groups (two ports each) at each tributary site, or a maximum of six ports per group.
FEP port sharing	Provides up to three separate FEP port-sharing groups.
NUMBER OF TRIBUTARIES	Supports up to 40 addressable tributary devices (40 DSUs or 20 DSUs and DBMs).
LINE SPEEDS	56 kbps (maximum usable data rate is 48 kbps)
CHANNEL SYNCHRONOUS RATES	
Primary (DSU)	1.2, 2.4, 4.8, 7.2, 9.6, 12.0, 14.4, 16.8, 19.2, 38.4, and 48 kbps
CHANNEL ASYNCHRONOUS RATES	150, 300, 600, 1200, and 1800 bps plus all primary (DSU) rates
PORT DTE INTERFACE	
3610 DSU (2-port MCMP/Flex)	Provides an additional 25-pin D-subminiature connector, for a total of two EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3610 DSU (6-port MCMP/Flex)	Provides five additional 25-pin D-subminiature connectors, for a total of six EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3611 DSU (modular)	Provides a 6-port connector module that provides a total of six 25-pin D-subminiature EIA-232 connections (including the DSU); in addition, a 26-pin high-density D-type connector that provides a V.35 interface through an adapter cable for Port 1.
3610 DSU (MCMP/DSD)	Provides five additional 25-pin D-subminiature connectors that can be optioned for EIA-232 or V.35, for a total of six EIA-232 or six V.35 interfaces.
3611 DSU (non-modular)	Provides one 60-pin high-density D-type connector that provides five additional EIA-232 interfaces through an adapter cable.
NMS SUPPORT	MCMP capability is fully supported by the COMSPHERE 6700 or 6800 Series NMS, Release 4.0 or greater for the 6700 Series NMS and Release 4.1.5 or greater for the 6800 Series NMS software in ADp and DATAPHONE II modes.

[1] Only MCMP circuit cards can be configured to provide MCMP capability.

Table 1-11
Digital Bridge Technical Specifications

Specifications[1]	Criteria
APPLICATION	
Digital Bridge	Provides 5-port digital bridging for various applications. Used primarily for multipoint dial backup, which can be configured as a central-site bridge or an extended bridge.
PORT SYNCHRONOUS RATES	
Primary (DSU) and Backup (DBM)	2.4, 4.4, 4.8, 9.2, 9.6, 12.0, 14.4, 18.8, 19.2, 38.4, 56 and 64 kbps
DIAGNOSTIC SUPPORT	Supports nondisruptive diagnostics (NonD), mixed, and disruptive (Disr) diagnostic types. The Disruptive Type configuration option must be set to either 3600e or Br56.
PORT DTE INTERFACE	
3610 DSU (2-port TDM/Flex or MCMP/Flex)	Provides an additional 25-pin D-subminiature connector, for a total of two EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3610 DSU (6-port TDM/Flex or MCMP/Flex)	Provides five additional 25-pin D-subminiature connectors, for a total of six EIA-232 or V.35 interfaces that can be set independently of each other when you have DSU firmware Release 6.28 or greater.
3611 DSU (modular)	Provides a 6-port connector module that provides a total of six 25-pin D-subminiature EIA-232 connections (including the DSU). In addition, a 26-pin high-density D-type connector provides a V.35 interface through an adapter cable.
3610 DSU (TDM/DSD or MCMP/DSD)	Provides five additional 25-pin D-subminiature connectors that can be optioned for EIA-232 or V.35, for a total of six EIA-232 or six V.35 interfaces.
3611 DSU (non-modular)	Provides one 60-pin high-density D-type connector that provides five additional EIA-232 interfaces through an adapter cable.
NMS SUPPORT	Digital bridging capability is fully supported by the COMSPHERE 6700 or 6800 Series NMS, Release 4.0 or greater for the 6700 Series NMS and Release 4.1.5 or greater for the 6800 Series NMS software in ADp and DATAPHONE II modes.
[1] TDM and MCMP circuit cards can be configured to provide digital bridge capability.	

Model 3610 Installation 2

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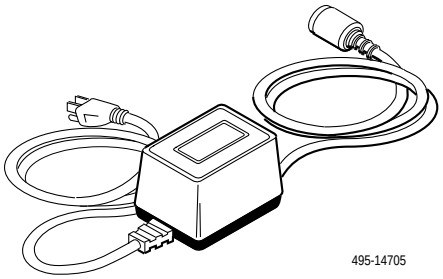
Overview

The Model 3610 DSU is delivered with default hardware strap settings and factory-installed software options.

The DSU is ready to connect to the network. No on-site assembly is required.



Before You Begin

Before connecting any cables to your DSU, verify the following:

- There is a dedicated grounded ac outlet within 6 feet that is protected by a circuit breaker. Label the circuit breaker that protects the ac outlet and ensure that the circuit breaker is set to ON.
- Your installation site is clean, well-lit, ventilated, and free from environmental extremes.
- You have contacted the telephone company to coordinate installing your DSU to the DDS network. The DSU can only operate at the data rate provided by the DDS network. The DBM, if enabled, should also be connected to the dial network.
- Your package contains a power cord with table-top ac transformer.

CAUTION

Only use the power transformer designed for the Model 3610 DSU. Using other transformers may result in personal injury or damage to the equipment.

Installation Process

- Installing the DSU
- Verifying the Hardware Strap Setting
- Powering Up the DSU
- DDS Network Connection

Installing the DSU

The Model 3610 DSU is designed for desktop operation.

- Place the DSU in the planned location.
- Allow 1 to 2 feet of clearance for cable connections, space for the ventilation slots on the sides, and clearance at the rear for the cable connections.

NOTE

Before powering up the DSU, verify the hardware strap settings. Refer to the User's Guide.

Powering Up the DSU

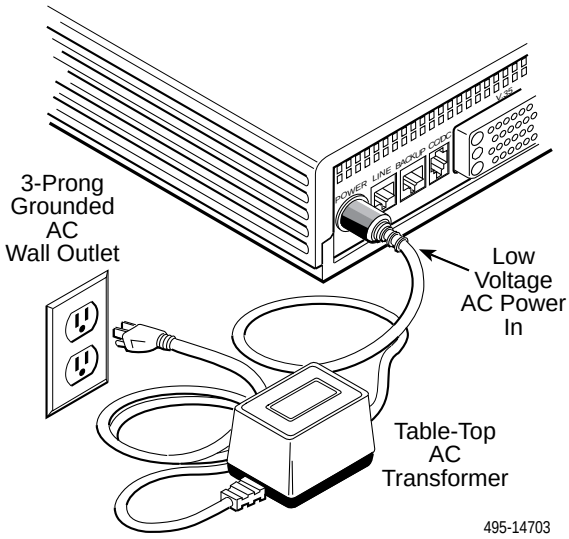
CAUTION

The power cord and ac transformer have a 3-wire grounding-type plug with a grounding pin. This is a safety feature. Grounding of the unit is vital to ensure safe operation. Do not defeat the purpose of the grounding plug by modifying it or by using an adapter.

Prior to installation, use an outlet tester or voltmeter to check the ac receptacle for earth ground. If the power source does not provide a ground connection, consult an electrician to determine another method of grounding the unit before proceeding with the installation.

☞ Procedure

1. At the rear of the DSU, insert the round end of the power cable into the receptacle labeled POWER.



2. Connect the 3-prong plug at the other end of the cable to an ac outlet.

Power-Up Routine

When you apply power, the DSU performs a power-up routine and:

- Determines what hardware options are installed, if any. This may include DBM, MUX, TDM, and MCMP.
- Automatically runs a Device Test on itself and each installed hardware option. All front panel lights flash on and off.

DDS Network Connection

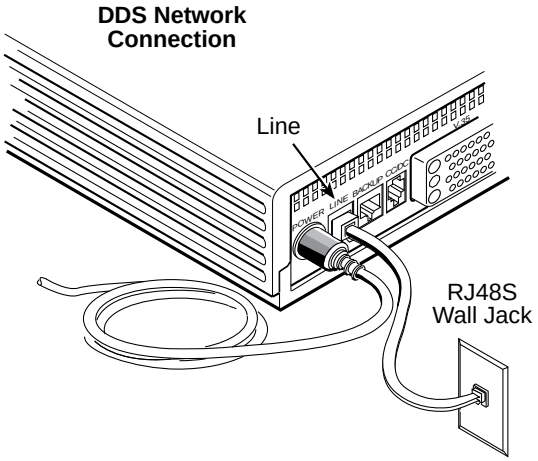
NOTE

Before connecting the DSU to the DDS network, ensure that approved primary protectors have been installed on the circuit in accordance with Article 800 of the National Electric Code, NFPA 70, in the United States and Section 60 of the Canadian Electric Code, Part 1, in Canada.

To connect the DSU to the DDS network:

☞ **Procedure**

1. Plug the DDS network interface RJ48S cable into the DSU jack labeled **LINE**.
2. For Canada, plug the 6-pin cable end (feature number 3600-F1-006) into the wall jack.



If a remote DSU is also connected to the network, the:

- DSU's green **OK** indicator lights
- **Alrm** indicator goes off
- Health and Status screen no longer displays a **No Signal** message

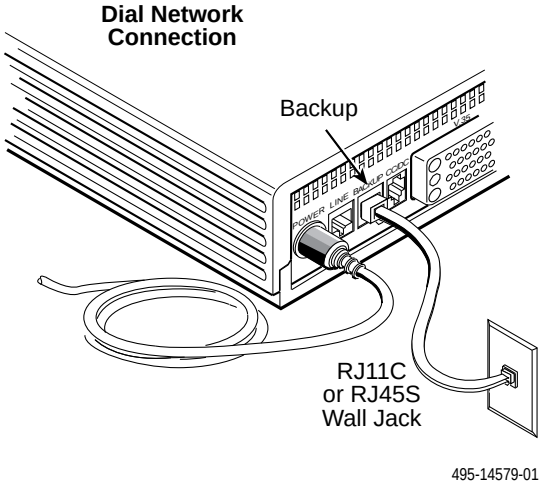
If connecting the DSU to a LADS network, there are distance limitations that govern the use of DSUs on the network. See Appendix F in the User's Guide for LADS connection distances.

Dial Network Connection

If your DSU is equipped with a V.32 or V.34 DBM:

☞ **Procedure**

1. Plug one end of the dial (analog) interface cable into the DSU jack labeled **BACKUP**.
2. Plug the other end of the cable into the modular jack provided by the telephone company:
   - USOC RJ11C (permissive) for V.32 or V.34
   - USOC RJ45S (programmable) for V.32 only
3. If your site has programmable service, verify that the DSU's hardware strap S1-1 is switched to the OFF position.



Refer to the *Verifying the V.32 DBM Hardware Settings* section in the DBM Supplement for hardware strap details.

Switched 56 kbps Network Connection

WARNING

Do not insert the 2-wire switched 56 kbps plug into an RJ11C jack providing PSTN service. This type of jack is intended for analog public switched telephone network (PSTN) devices. Doing so may cause equipment damage and harm to the telephone network.

To make a physical connection to the switched 56 kbps network:

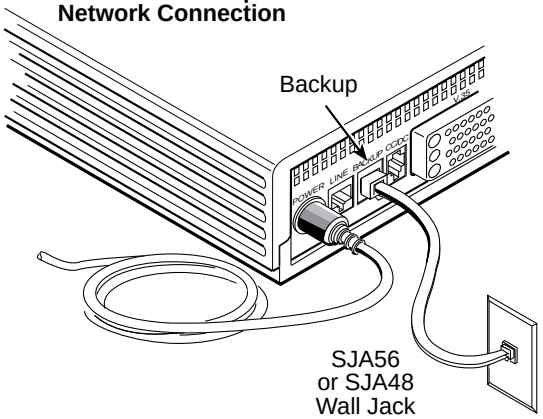
☞ Procedure

1. Plug one end of the switched 56 kbps network interface cable into the DSU jack labeled **BACKUP**. Verify that you have the right cable:

For a DSU with a . . .	Use the . . .
2-wire Switched 56 DBM	6-pin cable
4-wire Switched 56 DBM	8-pin cable

2. Plug the other end of the cable into the modular jack provided for the switched 56 kbps network connection.

Switched 56 kbps Network Connection



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ISDN DBM Network Connection

The 2-wire ISDN DBM has an integral Network Termination 1 (NT1). The NT1 provides the termination of the ISDN U-interface from the network.

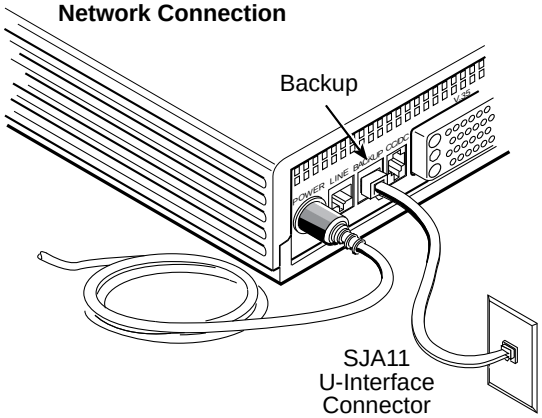
To make a physical connection to the ISDN network U-interface:

☞ Procedure

1. Plug one end of the ISDN network interface cable into the DSU jack labeled **BACKUP**.

2. Plug the other end of the cable into the modular jack provided for the ISDN network connection.

ISDN Network Connection



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3. Enter and save the following required fields:

   - SPID number(s) (**SPID**)
   - Switch type (**SwitchTyp**)
   - Local seven-digit telephone number(s) (**Phone**)

Refer to the *Configuration Branch* section in Chapter 3 and Appendix C, *Ordering ISDN Service*, in the DBM Options Supplement for details.